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Correlation between cardio-pulmonary exercise test variables and health-related quality of life among children with congenital heart diseases

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Background peak oxygen uptake (VO2) correlates with health related quality of life (QoL) in adults with heart failure. Cardio-pulmonary exercise test (CPET) is recommended in the follow-up of adults with congenital heart diseases (CHD). Few data is available as regards correlation between CPET and QoL among children with CHD.

Methods and results 202 CHD children aged 8 to 18 performed a CPET (treadmill n=96, cycle-ergometer n=106). CHD severity was stratified into 4 groups. All children and parents filled out the Kidscreen QoL questionnaire. Peak VO2, anaerobic threshold (AT), oxygen pulse followed a downward significant trend with increasing CHD severity and conversely for VE/VCO2 slope. Self-reported and parent-reported physical well-being QoL scores correlated with peak VO2 (respectively r=0.27, p<0.0001 and r=0.43, p<0.0001), percentage of predicted peak VO2 (r=0.28, p=0.0001 and r=0.41, p<0.0001), and percentage of predicted VO2 at AT (r=0.22, p<0.01 and r=0.31, p<0.0001). Significant correlations were also observed between several QoL dimensions and VD/VT ratio, oxygen uptake efficiency slope (OUES), oxygen pulse but never with VE/VCO2 slope. The strongest correlations were observed in the treadmill group, especially between peak VO2 and physical well-being for parents (r=0.57, p<0.0001) and self (r=0.40, p<0.0001) reported QoL.

Conclusions peak VO2 and anaerobic threshold are the two CPET variables which best correlated with self and parents-reported QoL in this large pediatric cohort. If QoL is involved as a "patient related outcome" in a clinical trial in pediatric cardiology, we suggest to use parents related QoL scores.

Clinical Trial Registration ClinicalTrials.gov (number NCT01202916).

The author hereby declares no conflict of interest

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What are the educational needs of adolescents and young adults with heart disease? Impact of an educational program

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Background Adolescents with heart disease have complex health needs and require lifelong cardiology follow-up. Interventions to facilitate paediatric to adult healthcare transition are recommended. We sought to determine the educational needs of adolescents and young adults with heart disease and the impact of a transition intervention on improving knowledge and self-management skills among this population.

Methods and results From September 2014 to May 2015, 115 adolescents and young adults with congenital heart disease or cardiomyopathy (mean age 17±2 years old, 47 girls) were consecutively enrolled. Twenty two have been included in a structured educational program 11 months before (educated group). The 93 others were allocated to usual care (non-educated group). Knowledge in all the patients was assessed using a same questionnaire exploring specific issues related to heart disease. In the non-educated group we observed significant gaps in knowledge: only 61% knew the name of their heart disease, 20% were aware of the recommended follow-up, 43% knew preventive measures of infectious endocarditis, and 8% of the girls were informed on the maternal risk of pregnancy. The mean total knowledge score in the educated group was significantly higher as compared to the non-educated (score=11.7/20±3.5 vs 8.6±3,2 p<0.01). In this group, the best scores concerned knowledge on follow-up, cardiac symptoms, prevention of endocarditis, and pregnancy risk (p<0.01). In multivariate analysis, provision of structured education was the only determinant of higher levels of knowledge (R=0.40, p<0.01) after adjustment for age, sex, heart disease complexity, school level and family status.

Conclusion Education at transition period has a significant impact on the adolescent knowledge above all those concerning their follow-up and their cardiovascular risk. Structured education program should improve adult understanding of their heart condition, and could prevent potential complications.

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Prognostic value of invasive hemodynamic parameters in Eisenmenger syndrome

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Introduction Usefulness of cardiac catheterization in Eisenmenger syndrome is controversial. We investigated the prognostic value of invasive hemodynamic parameters.

Methods 69 consecutive patients with congenital heart disease and pulmonary vascular resistance (PVR)>8UW.m^2 (Eisenmenger syndrome, n=63; non-correctable left-to-right shunt, n=6), with at least 1 catheterization after 1994, were included. Pulmonary artery pressures (PAP) and oxygen (O^2) consumption were measured using the same standardized method. PVR were calculated using the Fick principle. Outcome was assessed in 2015 and survival analysis was performed.

Results Mean age at first catheterization with this protocol was 38.4±13.3 y.o.. Pre-tricuspid, post-tricuspid and combined shunts were observed in 44 (63.8%), 23 (33.3%) and 2 (2.9%) cases. Patients were free of any pulmonary anti-hypertensive drugs in 54 (78.3%) cases. A Who status 3 or 4 was observed in 37 patients (53.6%). Median PVR and diastolic PAP were 24.6 [19.2-37.6] UW.m^2 and 40.0mmHg [34.5-50]. There was no complication. During a median follow-up of 7.2 y. [5.2-11.6], 23 (33.3%) patients reached a composite outcome criteria (death n=12; heart-lung transplantation n=8; transplantation list registration n=7). Outcome was associated with pulmonary O^2 sat. <70% (p=0.01), aortic O^2 sat. ≤88% (p=0.02), mixed venous blood O^2 sat. ≤65% (p=0.01), PVR ≥30UW.m^2 (p=0.02), diastolic PAP ≥45mmHg (p=0.01) and who 3-4 (p=0.01). After adjustment for the position of the shunt and the number of anti-hypertensive drugs, diastolic PAP≥45mmHg and Who 3-4 remained associated with outcome in Cox regression analysis (HR 5.6, p=0.006; HR=5.3, p=0.008). There were trends that did not reach significance for the other hemodynamic parameters.

Conclusion In addition to functional status, first catheterization provides prognostic information in patients with Eisenmenger syndrome. If these information could improve the therapeutic algorithm remains to be demonstrated (figure next page).

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